IV. AMENDMENTS TO THE DRAWINGS

- *THE DRAWINGS OF THE PATENT IS HEREBY AMENDED AS SET FORTH BELOW:*

There are no amendments to the drawings.

V. REMARKS/ARGUMENTS

- *STATUS OF CLAIMS*

Claims 1 to 46 are pending in the application.

- *RESPONSE TO ARGUMENTS*

- *Examiner's Stance:*

The Examiner alleges that while the Asanuma reference (U.S. Patent No. 5,920,819) discloses embodiments within the context of a frequency division multiple access (FDMA) system, the invention may be implemented in a code division multiple access (CDMA) system. The Examiner further observes that the Wheatley, III et al. reference (U.S. Patent No. 6,381,230) discloses the operation of a personal base station within a CDMA system.

The Examiner further alleges that while Rappaport (U.S. Patent No. 5,437,054) does not teach the use of micro-cells, this reference is used to teach frequency selection thus making the disclosure of micro-cells, multiplexing and TDM, FDM or CDM techniques unnecessary. The Examiner further alleges that Rappaport's failure to teach micro-cell within macro-cell architecture is not relevant since it would be obvious naturally flowing from the prior art.

The Examiner also alleges that the unspecified prior art implies that the data transmitted is non real-time data since it can be sent intermittently.

The Examiner, in addition, alleges that the Rappaport reference is used to teach power control for interference management. In addition, in response to the Applicants previous arguments to the contrary, the Examiner further restates "that since the micro-cell is smaller and transmits less power than the macro-cell, its interference will inherently be less than that of the macro-cell."

Finally, in response to the Applicant's argument that the Bloch reference (U.S. Patent No. 6,765,898), which teaches the use of antenna null steering to reduce interference received by a

micro-base station, is not relevant, the Examiner states that the applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.

- *Applicant's Response:*

Before responding to the specific arguments raised by the Examiner, in the latest office action, the Applicant respectfully submits the following background information to clarify the novelty of the instant claims with respect to the cited prior art references.

The objective of code-division, frequency-division, or time-division multiple access technology is to provide a means whereby multiple communications terminals may access a common communications network while maintaining inter-terminal isolation.

Frequency division multiple access (FDMA) attains this objective by partitioning the total available spectrum into separate channel bandwidths centered on unique frequencies and requiring each of the multiple communications terminals to operate in one of the separate channel bandwidths. Each terminal may access the common communications network on a continuous time basis. The number of potential accesses to the common communications network is limited to the number of available unique frequencies. Isolation of any FDMA terminal may be provided band pass filters centered at its assigned center frequency. Conventional communications theory teaches that the different channel frequencies are orthogonal to each other and may therefore be perfectly isolated from each other thereby eliminating interferenee. In practical systems, inter-terminal interference may be made negligible by proper specification and implementation of the band pass filter characteristics.

Time division multiple access (TDMA), analogously to FDMA, attains the access objective by partitioning the total available time into periodically repeating sequence of separate blocks-of-time. Each of the multiple communications terminals is assigned to a unique block-of-time within the periodically repeating sequence during which time the subject communication terminal may access the common communications network. Each terminal may access the common communications network at any frequency available to the communications network. The number of potential accesses to the common communications network is limited to the

number of available time-blocks in each sequence. Isolation amongst the multiple communications terminals is provided by allowing only one terminal to access the common communications network at a time. Here again, conventional communications theory teaches that different time blocks are orthogonal and may therefore be perfectly isolated from each other thereby eliminating the interference. In practical systems, inter-terminal interference may be made negligible by proper specification and implementation of the time-block switching waveforms and switches.

Code division multiple access (CDMA) attains the access objective by encoding the communications signal from each of the multiple communications terminals with a code word unique to the originating terminal. Each of the communications terminals may access the common communications network on a continuous time basis using all frequencies available to the network. The communications signals originating from a given terminal may be separated from the composite of all signals by decoding the desired signal using the unique code word associated with the originating terminal. In contrast to either FDMA or TDMA, conventional communications theory teaches that CDMA signals are <u>not</u> orthogonal to each other and cannot be perfectly isolated once combined. The remaining composite of signals from the other terminals act as self-interference background noise to the desired separated signal. As more terminals are added to the network, the interference noise level rises and the communications performance of each access degrades. While there is no limit to the number of code words, the practical number of accesses is restricted by the effect of self-interference background noise.

Thus, the inter-terminal interference control methods available to FDMA systems (i.e. use of different frequencies) and to TDMA systems (i.e., use of different time slots) are not available to a CDMA system. The Applicant claims methods and systems that maintain a quality of service, with respect to inter-terminal interference, without resorting to the use of different frequencies or time slots as taught in the cited prior references.

In Applicant's independent claim 1, a method of operating a CDMA system where a micro cell base station transmits non-real time data when permitted by the dynamically varying interference environment and a prescribed quality of service is maintained <u>solely</u> by limiting the power of signals transmitted from the micro base station is claimed. Whereas the Examiner

alleges that the cited prior patents teach power control for interference management, the prior references do not teach exclusive use of power control in the absence of either frequency or time multiplexing. Additionally, the cited prior art references do not teach or suggest the method of delaying the transmission of non real-time data as a method of interference management. The Applicant asserts that such strategic delay is not an undesirable interruption of service for non real-time data transmission. In contrast, the intermittency of transmission, referred to by the Examiner with respect to the prior references, is an undesirable interruption of service for real-time data transmission.

The Applicant calls the Examiner's attention to the significant distinction between real time data and non-real time data as commonly understood within the art. As a reference, the specification of U.S. Patent No. 5,768,350 to Venkatakrishnan includes the following definitions for real time and non-real time data:

> *The term "real-time", as used herein, refers to data which has a time element in its presentation and transfer. For example, if a speaker speaks for one second the local station generates corresponding voice samples, the voice samples should be received at the remote station and output to a listener starting shortly after the start of the speech (i.e., with low delay), and the voice samples should be received evenly over a period of roughly one second. If the voice samples did not arrive within one second, the speaker and listener will have difficulty carrying on a two-way conversation.*
>
> *By contrast, non-real time data, such as a still image, can be received over any period without ill effects, so long as the image is received when it is needed. In most applications, the time when an image is needed varies much more than the time needed to transmit the image, so that timing of the data's transmission is not very critical. For example, a facsimile image can be transmitted in 60 seconds. Suppose the speaker at the local station wishes to discuss the image with the listener at the remote station. In this case, a delay of one or two minutes is acceptable if the facsimile is sent before the conversation requires it, and the transmission need not be received evenly over the few seconds.*

The Applicant exemplifies non-real time data as WWW access and e-mail ([0030] of US Patent Application Publication No.: 2006/0019665). The employment of transmission delay for non-real time data as a method of interference management is not taught or claimed in any of the Examiner cited prior references.

In Applicant's independent claim 21, a computer controller for use with a CDMA system is claimed wherein the micro-cell base station transmits non-real time data when the dynamically varying interference environment permits and maintains the quality of service with respect to inter-terminal interference by limiting the power of the non-real time data.

Applicant's independent claim 46 claims a CDMA system which provides for the transmission of non-real time data from a micro-cell base station when permitted by the dynamically varying interference environment and maintains a predetermined quality of service with respect to inter-terminal interference by limiting the power of the signals transmitted from the micro base station.

Thus each of the Applicant's independent claims comprise:

a CDMA macro/micro cell system architecture;

transmission of non-real time data from a micro-cell station when permitted by the dynamically varying interference environment;

maintenance of a predetermined quality of service with respect to inter-terminal interference <u>solely</u> by limiting transmitted power without the use of separate frequencies or transmission time slots.

Each of the Applicant's other pending claims is dependent on one of these independent claims and thereby incorporates the limitations of the independent claims. The Applicant respectfully calls the Examiner's attention to MPEP 2143.03 that states that to establish prima facie obviousness of a claimed invention, <u>all</u> of the claim limitations must be taught or suggested by the prior art. The Applicant asserts that the prior reference cited by the Examiner as grounds for rejection. do not. either singly or in combination, teach or suggest all of the Applicant's claim limitations.

With respect to the Examiner's contention that the embodiments are taught by Asanuma (U.S. Patent No. 5,920,819) within an FDMA system, the Applicant asserts that the embodiments are inconsistent with an FDMA system as explained supra. Specifically Asanuma does not teach a CDMA system incorporating the delay of micro-cell base station transmission of non-real time data as a means for managing co-frequency interference in combination with interference control based solely on the dynamic limitation of micro-cell base station transmitted power. While Asanuma states that his invention can also be applied to a CDMA scheme (col. 12; lines 15-19) there is no enablement provided to support this statement and, as described supra, the methods disclosed in the patent are not available to a CDMA system. Further, the Asanuma reference does not identify or make the distinction between real-time and non real-time data and therefore does not teach the strategic delay of non real-time data transmission.

With respect to the Examiner's contention that the Wheatly, III et al. reference (U.S. Patent No. 6,381,230) discloses the operation of a personal base station within a CDMA system, the Applicant calls the Examiner's attention to the fact that the system taught by Wheatly, III et al. provides a dual mode user terminal to access either of two separate network infrastructures; a standard cellular telephone system, on the one hand, and a residential-type wireless telephone, on the other. The network context addressed by the Wheatly, III et al. reference is therefore a user terminal accessing either of two independent communications networks. The Applicant's claims, in contrast, teach a network architecture where a user terminal accesses a single network by way of either a macro- or micro- base station within that single network. The subject of multiple access interference management is not addressed by the Wheatly reference. As in the case of the Asanuma reference, the Wheatly, III et al. reference does not teach a CDMA system incorporating micro-cell base station strategic delay of transmission of non-real time data as a means for managing co-frequency interference in combination with interference control based solely on the dynamic limitation of micro-cell base station transmitted power.

With respect to Examiner's assertion that the Rappaport reference (U.S. Patent No. 5,437,054) is used to teach frequency selection, therefore disclosure of micro cells, multiplexing and TDM, FDM or CDM techniques is unnecessary, the Applicant reasserts, as described supra, that frequency selection has no relevance to a CDMA system. As in the case of the previous references, the Rappaport reference does not teach a CDMA system incorporating micro-cell

base station delay of transmission of non-real time data as a means for managing co-frequency interference in combination with interference control based solely on the dynamic limitation of micro-cell base station transmitted power.

With respect to the Examiner's statement that the prior art implies that the data transmitted is non real-time data, since it can be sent intermittently, the Applicant disagrees and respectfully calls the Examiner's attention to the definitions of real time data and non-real time data presented supra. Non real-time data is <u>not</u> real-time data sent intermittently. The Applicant claims, in contrast to the cited prior references, a system where the non real-time format of this data, by means of adjustable transmission delay, is used to manage a time varying interference environment. This strategic method is distinct from the cited prior art and should not be equated with the unplanned intermittency in transmission of real-time data alluded to by the Examiner's comments.

With respect to the Examiner's comment that while the Asanuma reference does not teach power control for interference management, the Rappaport reference is used to teach power control, the Applicant asserts neither of these references, taken alone or in combination, teaches exclusive use of power control in conjunction with delay of transmission of non-real time data. Here again, the cited references do not teach a CDMA system incorporating micro-cell base station delay of transmission of non-real time data as a means for managing co-frequency interference in combination with interference control based solely on the dynamic limitation of micro-cell base station transmitted power.

With respect to the Examiner's comment that since the micro-cell is smaller and transmits less power than the macro-cell, its interference will inherently be less than that of the macro-cell, the Applicant respectfully disagrees and offers the following comments. The desired signal to interference ratio is commonly defined at the receiving terminal location. The received power of the desired signal may be computed as:

Desired Signal Power Received (DPR) =

Desired Signal Power Transmitted (DPT) – Path Loss for Desired Signal (DPL)

Similarly, the received power of the interference may be computed as:

Interference Power Received (IPR) =

Interference Power Transmitted (IPT) – Path Loss for Interference Power (IPL)

The Path Loss factors are comprised, in part, of distance dependent free space loss, direction dependent antenna gains and transmission obstacles specific to the respective path. Thus, for example, the signal transmitted from the macro-cell base station might be the desired signal (DPT) and the signal transmitted by the micro-cell base station might be the interference (IPT). The power transmitted by the desired macro-cell base station (DPT), for exemplary purposes, would be greater than that transmitted by the interference micro-base station (IPT). The receiving terminal, however, may be at a location where IPL is sufficiently less than DPL so that IPR is greater than DPR. Thus, for this example case, the micro-cell interference would <u>not</u> be inherently less than that of the macro-cell.

With regard to the Examiner's position regarding the Bloch reference (U.S. Patent No. 6,765,898), the Applicant observes that the Bloch reference when taken by itself or any of the other Examiner cited prior references does not satisfy the requirement for a *prima facie* case of obviousness in accordance with MPEP 2143.03 that states that to establish *prima facie* obviousness of a claimed invention, <u>all</u> of the claim limitations must be taught or suggested by the prior art. Specifically the cited references do not teach a CDMA system incorporating micro-cell base station delay of transmission of non-real time data as a means for managing co-frequency interference in combination with interference control based solely on the dynamic limitation of micro-cell base station transmitted power.

The Examiner concluded the "Response to Arguments" section of the Office Action dated October 9, 2007, by maintaining the previous rejections. The Applicant respectfully requests that, in view of the additional arguments presented in this response in combination with those previously presented, the Examiner reverse the rejections.

- <u>*OBJECTIONS*</u>

- <u>*OBJECTIONS TO CLAIMS*</u>

  - <u>*Examiner's Stance*</u>

The Examiner has objected to dependent claims 10, 17 to 20, 30, and 37-40 as being dependent upon a rejected base claim but finds that they would be allowable if rewritten in independent form.

- *Applicants' Response*

The Applicant thanks the Examiner for the provisional allowance of claims 10, 17-20, 30, and 37-40. Based on the Examiner's anticipated vacating of a finding of obviousness with respect to claims 1 and 21, as explained below, the Applicant respectfully continues the submission of claims 10, 17-20, 30, and 37-40 in their present form.

- *REJECTIONS*

REJECTIONS UNDER 35 U.S.C. §103(a)

- *Examiner's Stance*

The Examiner has rejected claims 1 to 9, 11 to 16, 21 to 29, 31 to 36, and 41 to 46 as being obvious in view of Asanuma (U.S. Patent No. 5,920,819), Rappaport et al. (U.S. Patent No. 5,437,054), Wheatley III, et al. (U.S. Patent No. 6,381,230) and other cited references.

- *Applicants' Response*

Independent Claims 1, 21 and 46

The Examiner described the basis for factual inquires, set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), as being summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or non-obviousness.

The Applicant respectfully asserts that the cited prior art, **Asanuma (U.S. Patent No. 5,920,819)**, taken by itself, as well as in view of **Rappaport et al. (U.S. Patent No. 5,437,054)**, and **Wheatley III, et al. (U.S. Patent No. 6,381,230)** does not, on the basis of steps 1 and 2 of the steps for conducting factual obviousness inquires cited above, lead to a finding of obviousness.

As directed in step 1, above, the relevant scope and contents of the Asanuma (#5,920,819) patent are first examined. A similar examination of the cited Rappaport (#5,437,054) and Wheatley III (#6,381,230), patents are next conducted.

Asanuma (#5,920,819) teaches a cellular system comprising a plurality of macro-cells, which include micro-cells within a given macro-cell coverage area. Each cellular user, depending on its location, communicates with either a macro base station or a micro base station. Frequency division multiplex (FDD) is employed, with individual communications channels being time division multiplexed (TDM) on to each of the FDD carriers. A plurality of separate carrier frequencies is allocated for transmission from a given cellular user to its base station and is referred to by Asanuma (#5,920,819) as up-carrier frequencies. A corresponding, but different, plurality of separate carrier frequencies is allocated for transmission from the base station to the cellular users and is referred to by Asanuma (#5,920,819) as down-carrier frequencies. The macro- and the included micro- base stations share the same pluralities of carrier frequencies on a dynamic basis. Each cellular user/base station channel connection is assigned to a TDM time slot, on a given up-carrier frequency and a separate TDM time slot on another down-carrier frequency.

At locations within the macro-cell coverage area, where there is also micro-cell coverage, the potential for interference between macro-cell and micro-cell coverage exists. Asanuma (#5,920,819) teaches methods for selecting carrier frequencies, from the common pool, for micro-cell communications so that co-frequency interference to the macro-cell is maintained below an acceptable level. For situations where a corresponding pair of up-carriers and down-carriers cannot be identified, Asanuma (#5,920,819) teaches the time multiplexing (TDM) of the up-channels and down-channels onto a single carrier selected from either of the above-mentioned pluralities of carrier frequencies.

It is a fundamental to the teachings of Asanuma (#5,920,819) that there be a plurality of separate carrier frequencies, from which to select, thereby providing isolation between the various communications channels. The management of interference between the macro-cell and micro-cell systems is accomplished by dynamic assignment of the potentially interfering channels to different carrier frequencies.

Asanuma (#5,920,819) refers to CDMA only twice in the specification.

> *"Thus, in comparison with the conventional system in which both of the up carrier frequency and down carrier frequency of one pair of the macro cell system are required to simultaneously satisfy the preset condition, the carrier frequency for assignment can be searched for more easily and in a shorter time. Further, a sufficiently large number of channels for micro cell can be obtained, and as a result, the frequency utilization factor can be further enhanced. This effect is particularly effective in a system utilizing a* ***code division multiple access (CDMA)*** *system in which adjacent cells often use the same carrier frequency." (col 3, lines 26-35)*

In this first reference, Asanuma (#5,920,819) is clearly referring to a technique for selecting a useable carrier frequency for establishing communications. Even in that context, Asanuma (#5,920,819) only identifies the techniques applicability to the situation where adjacent cells, rather than overlapping coverage cells, are the potential interference source(s).

> *"In the above embodiment, a case wherein the FDMA scheme is used as the radio access scheme of the macro cell system is explained, but this invention can also be applied to a system using the TDMA scheme or* ***CDMA*** *scheme."(col 12, lines 16-19)*

In this second reference, Asanuma (#5,920,819) states that the teachings may be applied to a system employing TDMA or CDMA. As described supra, Asanuma (#5,920,819) fundamentally teaches, and claims, a system that manages the coexistence of a macro-cell and micro-cell system exclusively using FDM carrier selection techniques. These techniques are not available to pure TDMA or CDMA systems and the teachings of Asanuma (#5,920,819) are irrelevant.

Thus the two Asanuma (#5,920,819) references cited by the examiner do not teach the use of the disclosed technology for CDMA systems. Specifically,

a CDMA macro/micro cell system architecture;

transmission of non-real time data from a micro-cell station delayed, when necessary, in response to the dynamically varying interference environment;

maintenance of a predetermined quality of service with respect to inter-terminal interference solely by limiting transmitted power without the use of separate frequencies or transmission time slots.

The second Examiner cited prior art, Rappaport (#5,437,054), teaches a method and apparatus for managing the assignment and sharing of channels in a cellular system. The described system does not address the use of micro-cells within the coverage region of a given macro-cell nor does the teaching address a particular multiplexing or multiple access technique such as TDM, FDM or CDM.

Rappaport (#5,437,054) teaches a scheme for borrowing channels from an adjacent macro-cell, on an as-needed basis, to supplement the normal channel capacity of a given macro-cell base station, without the use of channel locking. Channel locking is a coordination technique, based on the cellular system's physical geometry, to prevent the reuse of the given channel within the "minimum separation distance" to a potentially interfering base station. "Minimum separation distance" is a frequency coordination concept that is used to specify the minimum physical separation distance between two potentially interfering stations. The Rappaport (#5,437,054) teachings include techniques for insuring that the interference level is maintained at an acceptable level through the use of power control.

It is observed that the Rappaport (#5,437,054) teachings are limited to system configurations in which each of the base stations, assigned to adjacent macro-cells, can provide shared communications resources which are orthogonal or isolated. Although not taught by Rappaport (#5,437,054), it is conventional practice to operate adjacent cells on different carrier frequencies. Thus the shared communications resource donated by an adjacent cell base station will not interfere with the cell's primary base station. This teaching is therefore not relevant for

the micro-cell within a macro-cell architecture where the micro- and macro- cell base stations share frequency, time and code domains and have the potential for mutual interference.

Here again the cited prior art does not teach the Applicant's claim limitations. Specifically,

a CDMA macro/micro cell system architecture;

transmission of non-real time data from a micro-cell station delayed, when necessary, in response to the dynamically varying interference environment;

maintenance of a predetermined quality of service with respect to inter-terminal interference solely by limiting transmitted power without the use of separate frequencies or transmission time slots.

The third Examiner cited prior art, Wheatley III (#6,381,230), teaches, in part, methods for avoiding unacceptable interference from a subscriber station, which is communicating with a micro-cell base station. The methods taught include terminating communication with the subscriber base station or executing a handoff of the subscriber station to the macro-cell base station when the transmit power of the subscriber station exceeds a predetermined threshold. It is important to recognize that the termination of transmission, as taught by this reference, differs from the strategic delay of transmission of non-real time data provided by the Applicant's claims. Termination is an interruption of transmission which is a failure of communications. Additionally, the cited prior art teaches variable power control of the subscriber station as a means of interference control. It should be noted that the teachings exclusively deal with interference originating from the subscriber or user station and not with interference originating at the micro-cell base station.

Here again the cited prior art does not teach the Applicant's claim limitations. Specifically,

a CDMA macro/micro cell system architecture;

transmission of non-real time data from a micro-cell station delayed, when necessary, in response to the dynamically varying interference environment;

maintenance of a predetermined quality of service with respect to inter-terminal interference solely by limiting transmitted power without the use of separate frequencies or transmission time slots.

The second step of the Grahm v. John Deere inquiry is ascertaining the differences between the prior art and the claims at issue. Claim 1, the first independent claim of the instant application specifies a method for operating a CDMA cellular system with a micro-cell within macro-cell architecture. Claim 21 is an independent claim for a computer operable controller which is operatively configured to carryout the teachings of claim 1. Claim 46 claims a cellular system that provides, in accordance with the teachings of claim 1, corresponding micro-cell within macro-cell operation. Independent claims 1, 21 and 46 are initially addressed.

As explained supra, each participant in a CDMA communications system utilizes the same "carrier" frequency on a continuous time basis. Thus there are no separate carrier frequencies or separate time slots available to isolate interfering channels in a CDMA system. The Applicant thus respectfully asserts that the teachings of Asanuma (#5,920,819) cannot be practiced by the CDMA system specified in the instant application.

The first limitation of claim 1 teaches:

> *"(1) providing at said micro cell base station* ***non-real time data services*** *when permitted by a dynamic interference level from the perspective of said micro-cell, which dynamic interference is caused by said macro cell base station."*

The second limitation of claim 21 correspondingly teaches:

> *" the computer operable controller comprising: a memory storing an algorithm providing a said micro cell base station* ***non-real time data services*** *when permitted by a dynamic intereference level from said micro cell, which dynamic interference level is caused by said macro cell base station;"*

The first limitation of claim 46 correspondingly teaches:

*"(1) to provide at said micro cell base station **non-real time data services** when permitted by a dynamic interference level from the perspective of said micro cell, which dynamic interference is caused by said macro cell base station;"*

The teaching of delaying transmission of non-real time data, by the micro-cell base station, until interference limitation requirements are satisfied, is, in part, a differentiation over the cited prior-art. The provision of non-real time data transmission is supported by multiple paragraphs in the specification. In [0006] of U.S. Patent Application Publication No. 20060019665 it is stated that, "By utilizing the ability to delay packet switched data for the users in the micro cell, the service of circuit switched users in the macro cell can be prioritized whilst serving all users in the same frequency band(s)." While [0051] describes the conditions for handover to a micro-cell base station where it is stated that, " This threshold depends on the type of non-real time service, and micro and macro cell load and interference level." Other sections of paragraphs [0053] and [0074] describe the queuing of non-real time data.

Therefore, the Applicant further respectfully asserts that neither Asanuma (#5,920,819) or Rappaport (#5,437,054) or Wheatley III (#6,381,230), or any combination, does not teach the content of instant independent claims 1, 21 and 46, with respect to the employment of non-real time data transmission techniques as a method of interference management.

The fourth limitation of claim 1 teaches:

*"(4) maintaining said quality of service above said predetermined threshold for any cellular communications device(s) served by the at least one macro cell base station that is within a predetermined range of the micro cell base station **by limiting the power of signals transmitted in step (1) from the at least one micro cell base station**."*

The fifth limitation of claim 21 correspondingly teaches:

*"whereby said computer is programmed to maintain said quality of service above said predetermined threshold for any cellular communication device(s) served by the macro cell base station that is within a predetermined range of the micro cell base station **by limiting the power of signals comprising said non-real time data services transmitted from the micro cell base station**."*

The fourth limitation of claim 46 correspondingly teaches:

> *"(4) to maintain said quality of service above predetermined threshold for any cellular communication device(s) served by the at least one macro cell base station that is within a predetermined range of the micro cell base* ***station by limiting the power of signals transmitted in step (1) from the at least one micro cell base station.****"*

The instant claims, therefore, teach the use of limiting or reducing the power level of the micro-cell base station as a means of maintaining the quality of service for any user of the co-coverage macro-cell base station.

The Applicant therefore respectfully asserts that Asanuma (#5,920,819) does not teach the content of instant independent claims 1, 21 and 46, with respect to power control for interference management. In addition, with respect to this same limitation, the Examiner has cited Rappaport (#5,437,054) as teaching that,

> *"... a channel can be borrowed at limited transmitted power. In order to avoid possible increases in co-channel interference caused by channel borrowing, the borrowed channels are utilized with reduced or limited transmitted power."*

One of ordinary skill would understand, after studying Rappaport (#5,437,054), that the co-channel interference referred to in the Rappaport (#5,437,054) teachings is the interference between regular macro-cell base stations having separated geographical coverage areas or cells, where the described channel borrowing would violate the normal "minimum separation distance" requirements employed for frequency coordination. The system context of the Rappaport (#5,437,054) teachings is in contrast to the instant application where the interfering base stations share a common coverage area. The Applicant respectfully asserts, that, based on these facts, the Rappaport (#5,437,054) teachings are irrelevant with respect to a Grahm obviousness inquiry.

The Applicant also respectfully asserts, that with respect to the fourth limitation of claims 1 and 46 and the fifth limitation of claim 21, the limiting the power of signals clearly refers to signals being transmitted from the micro-cell base station, not those emitting from the subscriber or user station. As previously stated, the teachings of Wheatly III, et al. are limited to emissions

of the subscriber or user station. The Wheatly III teachings do not therefore encompass the fourth limitation of instant claims 1 and 46 and the fifth limitation of claim 21.

On the basis of the above comparisons of the instant independent claims 1, 21 and 46 to the Examiner cited prior art Asanuma (#5,920,819), Rappaport (#5,437,054) and Wheatley III (#6,381,230) patents, the Applicant respectfully asserts that a finding of **obviousness <u>can not</u> be concluded** in accordance with steps 1 and 2 of the Grahm v. John Deere guidelines, or in view of MPEP 2143.03 where it is stated that in order to establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.

With respect to claim 3 (Office Action 01/26/2007; page 8), the Examiner states, "… that since the micro-cell is smaller and transmits less power than the macro cell, its interference will inherently be less than that of the macro cell." The Applicant disagrees with this statement as explained supra.

<u>Dependent Claims 2, 3, 4, 5, 7, 8, 42, 43, and 44</u>

Claims 2, 3, 4, 5, 7, 8, 42, 43,and 44 depend either directly or in directly on independent claim 1. The Applicant respectfully asserts that claim 1 is nonobvious as explained supra. In accordance with MPEP para. 2143.03, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. Therefore, it should be concluded that dependent claims 2, 3, 4, 5, 7, 8, 42, 43 and 44 are nonobvious and should be allowed.

<u>Dependent Claims 22, 23, 24, 25, 27, 28, and 41</u>

Claims 22, 23, 24, 25, 27, 28, and 41 depend either directly or in directly on independent claim 21. The Applicant respectfully asserts that claim 21 is nonobvious as explained supra. In accordance with MPEP para. 2143.03, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. Therefore, it should be concluded that dependent claims 22, 23, 24, 25, 27, 28, and 41 are nonobvious and should be allowed.

<u>Dependent Claims 6 and 26</u>

Claim 6 depends indirectly on independent claim 1. Claim 26 depends indirectly on independent claim 21. The Applicant respectfully asserts that claims 1 and 21 are nonobvious as

explained supra. In accordance with MPEP para. 2143.03, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. Therefore, it should be concluded that dependent claims 6 and 26 are nonobvious and should be allowed.

Dependent Claims 9 and 29

Claim 9 depends indirectly on independent claim 1. Claim 29 depends indirectly on independent claim 21. The Applicant respectfully asserts that claims 1 and 21 are nonobvious as explained supra. In accordance with MPEP para. 2143.03, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. Therefore, it should be concluded that dependent claims 9 and 29 are nonobvious and should be allowed.

Additionally, the Examiner has cited Bloch (U.S. Patent No. 6,765,898), as teaching the use of antenna null steering to reduce interference received by the micro-cell base station. The Applicant respectfully asserts that the teachings of the Bloch patent (#6,765,898) are not relevant, in that the instant application only addresses interference transmitted by the micro-cell base station.

Dependent Claims 11, 31, and 45

Claim 11 depends directly on independent claim 1. Claim 45 depends indirectly on independent claim 1. Claim 31 depends directly on independent claim 21. The Applicant respectfully asserts that claims 1 and 21 are nonobvious as explained supra. In accordance with MPEP para. 2143.03, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. Therefore, it should be concluded that dependent claims 11, 31, and 45 are nonobvious and should be allowed.

Dependent Claims 12, 13, 32, and 33

Claims 12 and 13 depend directly on independent claim 1. Claim 32 depends directly on independent claim 21. Claim 33 depends indirectly on independent claim 21. The Applicant respectfully asserts that claims 1 and 21 are nonobvious as explained supra. In accordance with MPEP para. 2143.03, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim

depending therefrom is nonobvious. Therefore, it should be concluded that dependent claims 12, 13, 32, and 33 are nonobvious and should be allowed.

Dependent Claims 14 and 34

Claim 14 depends directly on independent claim 1. Claim 34 depends directly on independent claim 21. The Applicant respectfully asserts that claims 1 and 21 are nonobvious as explained supra. In accordance with MPEP para. 2143.03, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. Therefore, it should be concluded that dependent claims 14 and 34 are nonobvious and should be allowed.

Dependent Claim 15

Claim 15 depends directly on independent claim 1. The Applicant respectfully asserts that claim 1 is nonobvious as explained supra. In accordance with MPEP para. 2143.03, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. Therefore, it should be concluded that dependent claim 15 is nonobvious and should be allowed.

Dependent Claims 16 and 36

Claim 16 depends directly on independent claim 1. Claim 36 depends directly on independent claim 21. The Applicant respectfully asserts that claims 1 and 21 are nonobvious as explained supra. In accordance with MPEP para. 2143.03, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. Therefore, it should be concluded that dependent claims 16 and 36 are nonobvious and should be allowed.

Dependent Claim 35

Claim 35 depends indirectly on independent claim 21. The Applicant respectfully asserts that claim 21 is nonobvious as explained supra. In accordance with MPEP para. 2143.03, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. Therefore, it should be concluded that dependent claim 35 is nonobvious and should be allowed.

CONCLUSION TO REMARKS

Applicant asserts that this response is fully responsive to the Examiner's Office Action dated October 9, 2007. In view of the above, it is respectfully submitted that the subject matter of the pending claims is patentable over the references cited. Applicant respectfully seeks early allowance of the pending claims.

Respectfully Submitted,

January 2, 2008

Marvin R. Wachs,
Reg. No.: 58,227
KELLEY DRYE & WARREN LLP
400 Atlantic Street
Stamford, CT 06901
Phone 203-351-8072
Fax: 203-327-2669
E-mail:mwachs@kelleydrye.com

VI. APPENDIX

- **No appendix is attached.**